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Patient Safety Competencies in Rural ASN Students: an Evidence-based Curricular Innovation

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PATIENT SAFETY COMPETENCIES IN RURAL ASN STUDENTS: AN EVIDENCE-BASED CURRICULAR INNOVATION

by

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DEDICATION

This project is dedicated to my best friend and husband, Keith, without whom I could not have completed this goal. I am forever thankful for your unwavering support of my ambitions and dreams. Thank you for picking up the slack and being at my side.

ACKNOWLEDGMENTS

I would like to acknowledge Dr. Amy Cory for her guidance throughout this project. Your expertise and advice were indispensable. I also thank the college that served as the site of this project, particularly the Division of Nursing, for providing a simulation lab in which to conduct this project. It is my intention that this project will augment your simulation program. Finally, I am thankful to Jesus Christ, my Lord and Savior through Whom all things are possible.

TABLE OF CONTENTS

LIST OF TABLES

Table **Page**

LIST OF FIGURES

ABSTRACT

Hospital clinical experiences are important events in prelicensure nursing education. Benefits include the opportunity for students to experience actual nursing responsibilities, immersion into environment, and professional socialization. However, challenges in finding appropriate clinical experiences include competition over clinical sites, decreasing patient acuity, and high student-faculty ratios. Rural schools of nursing have these challenges and those inherent in rural environments such as limited health care access, restricted critical access hospitals, and limited resources. The purpose of this evidence-based practice project was to plan, implement, and evaluate the use of a series of patient care simulations as an educational intervention to improve patient safety competencies while caring for multiple patients in prelicensure students at a remote rural two-year college in the Midwest. The project aimed to answer the PICOT question: In rural ASN prelicensure students, what is the effect of a series of multiple patient simulations as compared to baseline on patient safety competency? The Promoting Action on Research in Health Sciences (PARiHS) framework was used to guide project implementation and evaluation and the Nursing Education Simulation Framework (NESF) was used to guide the simulations. Participants were observed and the data statistically analyzed. There was a decrease in safety errors in observed competencies from 25 errors in 100 behaviors in the first to 12 errors in 100 behaviors in the fourth simulation. Findings support the use of a series of multiple patient simulations in prelicensure nursing education to improve patient safety competency. Incorporating this educational intervention into rural nursing curricula is recommended.

Keywords: prelicensure nursing education, safety competency, simulation

CHAPTER 1

INTRODUCTION

A key component of undergraduate nursing education is hospital-based clinical experiences. During hospital-based clinical experiences, students experience the actual responsibilities of patient care such as full medication administration, multiple patient assignments, and moment-by-moment changes in patient status. During hospital clinical experiences students also begin socialization into the profession of nursing through immersion in the healthcare environment. However, adequate hospital clinical experiences are difficult to achieve at times because of increasing competition for clinical sites, decreasing patient acuity, and high student-faculty ratios (Daigle, 2008). These challenges are present in remote rural nursing programs and are compounded by challenges related to the health disparities of the rural communities they serve such as limited access to healthcare resources, restricted Critical Access Hospitals, and limited resources. The challenges inherent in rural schools of nursing require alternative clinical solutions to ensure graduates are adequately prepared for practice.

Background

The site of this project is a rural, private, liberal arts community college offering an associate of science in nursing (ASN). The college's annual total school enrollment is approximately 500 students. Enrollment within the nursing program is approximately 100 students annually. Together the nursing students and prenursing students comprise about sixty percent of the student body.

Hospital clinical experiences at the college face the typical challenges inherent in any nursing education program; however, at this college, clinicals are also limited by the

dynamics of the college itself. The nursing program is a relatively new program, having graduated only seven nursing cohorts. The faculty continues to build and revise the curriculum based on identified successes and opportunities. The faculty members seek out new methods of instruction in the challenging remote rural healthcare culture. The college administration supports the efforts of the faculty members and has recently purchased high-fidelity mannequin to supplement hospital-based clinical experiences.

Student dynamics also impact hospital clinical experiences. An open enrollment status and the mission of the college to afford every student the chance to attend college creates wide diversity in the learning abilities of the student population. The average age of nursing students in the program is consistently between twenty-nine and thirty-two years. The majority of students are nontraditional returning students who work full-time and have family and household obligations. The average percentage of students with special learning accommodation needs is ten to fifteen-percent.

Efforts to ease the problems facing clinical education are being explored throughout nursing education. The challenges that rural nursing programs face require unique and innovative approaches to ensure that graduates are safe and effective nursing care providers. The Quality and Safety Education for Nursing (QSEN, 2011) initiative established competencies for all levels of nursing, including prelicensure nursing graduates. The competencies are organized into six domains. Each domain has associated knowledge, skills, and attitudes (KSAs) that may be used to measure the defined competencies (QSEN, 2011). Utilizing the KSAs to guide clinical experience may be challenging in rural schools of nursing because of the barriers they face.

High fidelity patient simulation (HFPS) is one method of ensuring rural nursing students receive adequate clinical experiences (Berndt, 2010). The ultimate goal of high-fidelity simulation is to expose prelicensure nursing students to similar situations found in practice. The nurse who has been thoroughly prepared through simulation has reduced chances of committing an error (Strouse, 2010). Use of HFPS in rural schools of nursing provides clinical experiences that would otherwise not be available in rural hospitals. Rural nurse educators must implement innovative simulation experiences to incorporate the QSEN competencies and ensure the KSAs are mastered to prepare graduates for safe practice.

Statement of the problem

The QSEN initiative is the response to the Institute of Medicine's (IOM, 2003) report that called for educational reform for health care professionals that includes quality and safety goals and evidence-based pedagogy (Ironside, Jeffries, & Martin, 2009). Nurses are the most likely health care professional to recognize, interrupt, and correct potentially life-threatening errors (Chenot & Daniel, 2010). However, routine examination of patient safety issues as part of daily practice is not included in nursing education. Nurses are not adequately prepared to provide the highest level of safety and quality (Chenot & Daniel, 2010). Today's nursing graduates must be prepared to place patient safety and quality at the forefront of their practice. Patient safety must be included in educational curricula and practice prior to graduation.

The importance of learning in a simulated environment and the effectiveness of simulation have been supported throughout the literature (Cant & Cooper, 2009; Lapkin, Fernandez, Levett-Jones, and Bellchamber, 2010; Laschinger, Medeves, Pulling,

McGraw, Waytuck, Harrison, and Gambeta, 2008; Radhakrishnan, Roche, and Cunningham, 2007; Robertson & Bandali, 2008, Walker, 2008). Organizations such as the Joint Commission, the Institute of Healthcare Improvement (IHI), and the Agency for Healthcare Research and Quality (AHRQ) now recognize and recommend simulation (Strause, 2010). The Institute of Medicine also recommends the use of simulation to improve patient safety (Strause, 2010).

Data from the clinical agency supporting the need for the project

The college where this evidence-based practice (EBP) project took place is incorporating the QSEN KSAs across the nursing curriculum. During this curricular revision, the nursing faculty has also considered the limited availability of clinical experiences particularly the absence of the opportunity to practice patient safety as an independent nurse caring for multiple patients.

This EBP project used multiple patient care simulations to include concepts related to patient safety competencies. This project aimed to address the absence of opportunity for nursing students to care for multiple patients and make clinical judgments about patient safety independently. The goal was that nursing students demonstrate improved patient safety competencies and translate those competencies into clinical practice.

Purpose of the EBP project

The purpose of this EBP project was to plan, implement, and evaluate the use of multiple patient care simulations as an educational intervention to improve patient safety competencies while caring for multiple patients in prelicensure students at a rural

Midwestern college. The expected outcome was that students will have improved patient safety competencies after participation in a series of multiple patient simulations.

Identify the compelling clinical question

To identify the compelling clinical question, the existing simulation program was considered and current literature was reviewed for information pertaining to patient safety in prelicensure nursing education. The QSEN KSAs were compared to the current curricular outcomes in an attempt to identify the correct clinical question. The population was identified as prelicensure nursing students; the sample for the project was a cohort of ASN students. The intervention of interest was simulation; effect of the intervention was compared across the project from beginning to end. The outcome of focus was patient safety competencies as measured by an instrument based on the QSEN patient safety competencies (Ironside, Jeffries, and Martin, 2009). The time frame was four weeks. The compelling clinical question is: What is the effect of simulation as an educational intervention on patient safety competency in prelicensure nursing students?

Thus, according to the format recommended by Melnyk and Fineout-Overholt (2005), the PICOT (i.e., population, intervention of interest, comparison intervention or status, outcome, and timeframe) statement is: In rural ASN prelicensure students, what is the effect of a series of multiple patient simulations as compared to baseline competency on patient safety competencies over four weeks?

Significance of the project

The nursing faculty members at the college where the EBP project took place are credentialed as Certified Nurse Educators by the National League for Nursing (NLN).

The NLN established core competencies for nurse educators (Harris, 2011). Competency for nurse educators requires development of evidence-based teaching practices and the use of technology (Harris, 2011). To maintain competence nurse educators must make efforts to move away from traditional lecture techniques and hospital-based clinical experiences and utilize interventions supported by the evidence to be effective. Application of evidence-based educational interventions in rural schools of nursing requires innovative approaches.

Implementation of this project will improve the curriculum at the college where the project took place by ensuring graduates have had the opportunity to care for multiple patients independently. Students will be given the opportunity to function as the primary nurse, an experience currently lacking from the clinical experiences at this college. The students will assume the role of the primary nurse and have the opportunity to practice safety competencies including management of care, delegation, communication, and teamwork.

The EBP project contributes to the growing body of evidence-based educational interventions by applying the best evidence available. Successful implementation of existing evidence strengthens the credibility of the evidence. The project will establish best methods for rural ASN programs to implement evidence-based simulation experiences to ensure adequate exposure to patient safety concerns in clinical environments when caring for multiple patients.

CHAPTER 2

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

Simulation is increasing in use throughout nursing education. At the college where this project took place, the nursing faculty is interested in expanding the simulation program and incorporating patient safety competencies across the curriculum. When planning simulation teaching, strategy and curricular inclusion must be considered (Hyland & Hawkins, 2009). A thorough review of the literature was conducted and the Nursing Education Simulation Framework (NESF) was selected to serve as the theoretical framework for this project. The framework incorporates significant factors including the teacher, the student, educational practices, simulation design characteristics, and outcomes (Jeffries & Rogers, 2007).

Theoretical framework

The NESF specifies the relevant variables in simulation and the relationships among those variables (Jeffries & Rogers, 2007). The model has five major components. The five major components of the model include teacher factors, student factors, educational practices, simulation design characteristics, and outcomes (see Figure 2.1). Each of these factors were explored in detail and applied to the evidence-based project.

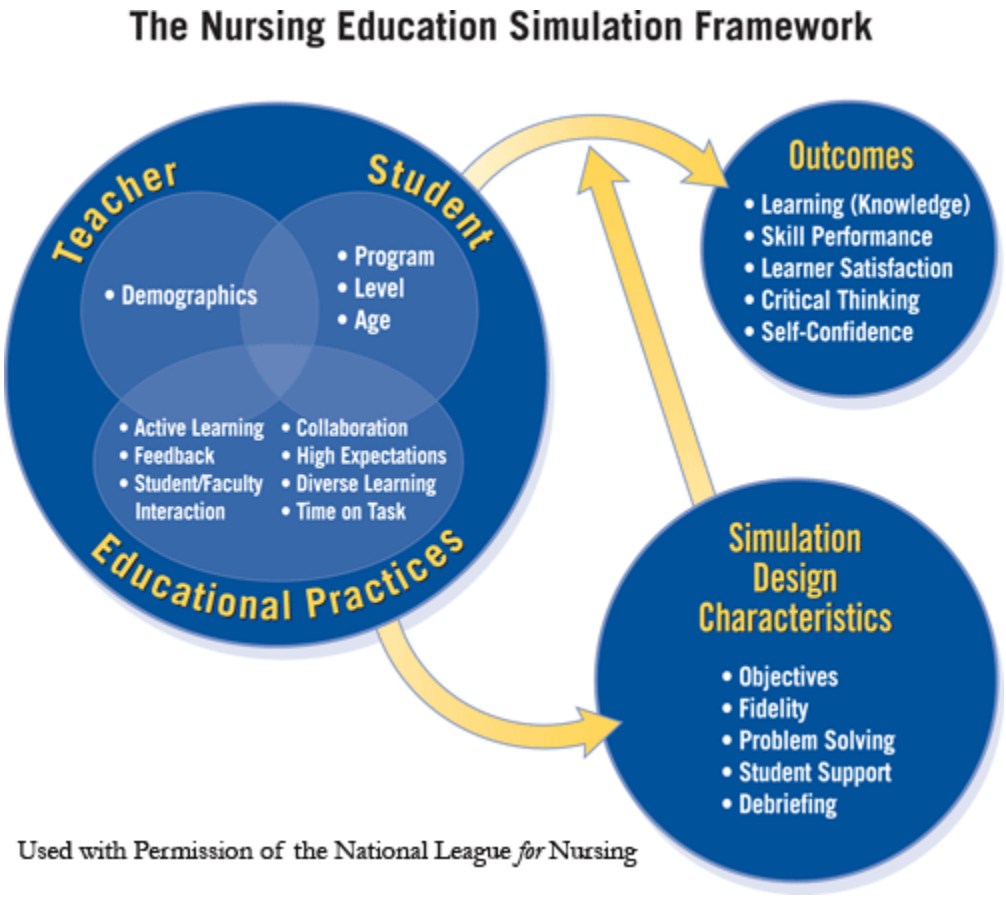

Figure 2.1 The Nursing Education Simulation Framework

Teacher factors are significant to successful simulation instruction (Jeffries & Rogers, 2007). The teacher serves a facilitator of learning with student-centered instruction. Learning is facilitated by support as needed during simulation and the debriefing session following the simulation (Jeffries & Rogers, 2007). Successful facilitation requires that the teacher be comfortable with the simulation.

Student factors include the student's responsibility for learning and motivation. Jeffries and Rogers (2007) state students are more likely to take responsibility for learning and to be self-directed when the ground rules for the simulation are presented prior to the experience, this process is termed *briefing*. Another component of briefing is

introducing students to the role they are expected to play during the simulation. Student competition is usually negative during a simulation experience and should be discouraged (Jeffries & Rogers, 2007).

Educational practices during simulation should result in student learning and satisfaction (Jeffries & Rogers, 2007). Jeffries and Rogers (2007) state that educational practices to enhance simulation effectiveness should be based upon Chickering and Gamson's (1987) Seven Principles for Good Practice in Undergraduate Education, including active learning, prompt feedback, student-faculty interaction, collaboration among students, high expectations, respect for diverse talents and ways of learning, and time on task.

In analyzing Chickering and Gamson's (1987) seven principles as they relate to simulation, the principle of active learning in simulation is accomplished through active participation. Students are directly involved in the activity ranging from simple involvement to complex involvement. Simple involvement may include observing another student engaged in the simulation while complex involvement may include caring for a critically ill simulated patient.

Feedback in simulation may come from the instructor, peer, human patient simulator (HPS), or patient actor and is immediate. Feedback from the instructor may include encouraging comments or corrective guidance during the simulation. Peer feedback during simulation may include a dialogue between students engaged in caring for the patient in the simulation. Feedback from the HPS or patient actor comes as a response to the students' decisions or actions during the scenario. Also in simulation,

feedback is received from the student to the faculty and allows for immediate evaluation of knowledge and skill mastery.

Student-faculty interaction in simulation occurs through discussion about concepts or goals as well as questions during the simulation (Jeffries & Rogers, 2007). This student-faculty interaction may occur as feedback or may be integrated into the scenario.

Collaborative learning in simulation is accomplished through teamwork and collaboration among students, instructors, and other health professionals as in real life (Jeffries & Rogers, 2007). The simulation scenario closely mimics real life and requires participants to engage with other members of the team to make decisions and provide care.

High expectation of student performance and knowledge mastery in simulation fosters achievement of student goals and expanded competencies (Jeffries & Rogers, 2007). In simulation, students are expected to perform at a level equal to that of the registered nurse practicing independently. The expectation should be that the student is competent in caring for the patient in the scenario.

Simulation accommodates diverse learning styles, background, and experiences. Specifically, simulation accommodates visual learning through the visualization of the scenario through immersion in the simulated environment. Simulation accommodates auditory learning through the simulated environmental sounds and conversations. Simulation also accommodates social learning styles through the simulation of teamwork and collaboration of simulation participants.

Finally, simulation fosters time on task with clear and realistic time frames. Time on task is also enhanced by focusing the simulation on a few key concepts (Jeffries & Rogers, 2007). Simulation is a “snap-shot” of the real world re-created for a specific learning task (Jeffries, personal communication, 2011). This recreation has a purpose and allows the faculty to manipulate the situation to ensure that learning occurs.

The NESF includes simulation design as a key component (Jeffries & Rogers, 2007). Simulation design includes five key variables to be successful. The five variables are objectives, planning, fidelity, complexity, cues, and debriefing.

When designing a simulation objectives should be clearly written to guide student learning (Jeffries & Rogers, 2007). Objectives should include the expected timeframe of the experience, expected roles, and student debriefing of the scenario and objectives before the experience. Objectives should be structured with well-planned learning strategies.

When designing simulation fidelity, or realism, is an important variable. The simulation experience should mimic clinical reality as closely as possible. Fidelity includes realistic environmental factors and items used to increase realism as well. Fidelity is also enhanced by providing limited information about the clinical situation before the experience, allowing free exploration of the situation by the students, and providing clinical information over time during the simulation (Jeffries & Rogers, 2007).

The complexity of simulations ranges from simple to complex (Jeffries & Rogers, 2007). The complexity of the simulation mimics the complexity of real life clinical situations. When planning the simulation experience, complexity should be considered including the complexity of the decisions, the environmental cues, and underlying

relationships among those decisions, environmental cues (Jeffries & Rogers, 2007). The complexity of a simulation depends up on the learning objective for that simulation. A more complex simulation may involve multiple decisions, multiple tasks, and multiple team members; whereas a simple simulation may involve only one decision or task.

Cues, or prompts, during a simulation assist students through the activity and contribute to the learning experience (Jeffries & Rogers, 2007). Cues may come from faculty in the form of guided questions or student questions in the form of finding the answer to a problem or from changes in the clinical situation such as changes in vital signs. Cues also may be prompts to assist students to continue to process the data gathered during the simulation experience (Jeffries & Rogers, 2007).

Debriefing takes place at the end of the simulation experience and is conducted in a group including the participants of the simulation and the facilitator of the simulation. Debriefing is a time for participants to reflect on the simulation including their performance and the overall progression and outcome of the simulation. Debriefing following a simulation exercise reinforces the positive aspects of the experience and encourages reflective learning. Debriefing allows students to link theory with practice and research. Debriefing also allows students to think critically about the experience and discuss appropriate actions in complex situations. (Jeffries & Rogers, 2007). Debriefing may be open allowing participants to reflect upon the experience without direction or guided by the facilitator utilizing specific prompts and questions to direct the discussion.

The final component of the NESF is outcomes. Outcomes include knowledge, skill performance, learner satisfaction, critical thinking, and self-confidence (Jeffries &

Rogers, 2007). Simulation is as effective as other forms of interactive teaching in knowledge acquisition Cant & Cooper, 2009) Medium and high fidelity simulation using manikins is an effective teaching and learning method when used with best practice guidelines (Cant & Cooper, 2009). Skill performance is practiced in the simulation experience without the risk of harm to actual patients (Jeffries & Rogers, 2007). Learner satisfaction with simulation is easily measured quantitatively as well as qualitatively. This information is used to enhance future simulation activities. Critical thinking is practiced during the simulation experience as students are confronted with clinical situations that mimic real life. Finally, self-confidence is improved with simulation (Cant & Cooper, 2009; Jeffries & Rogers, 2007). The self-confidence that is gained through simulation can be transferred into real clinical situations (Jeffries & Rogers, 2007).

Application of theoretical framework to EBP project

The NESF provided the framework for this project. To ensure positive outcomes, the key factors of the model were applied including the teacher, the student, educational practices, simulation design characteristics, and outcomes (Jeffries & Rogers, 2007).

The teacher in this project was a Doctor of Nursing Practice (DNP) student. The DNP student has received specialized training for the design and implementation of all types of simulation. The DNP student coordinated the simulation experiences at the college where this project took place since 2006 including high fidelity simulation across the curriculum. The DNP student will also plan the simulation and serve as facilitator of the EBP project and of the simulation. Thus, the DNP student was comfortable with simulation in general and particularly comfortable with the simulation in this project.

The educational practices utilized in planning and implementing the simulation were based upon Chickering and Gamson's (1987) Seven Principles for Good Practice in Undergraduate Education of active learning, feedback, student-faculty interaction, collaborative learning, high expectations, student diversity, and time on task. The simulation required students to actively participate as a nurse. During the simulation, feedback came from the DNP student, the human patient simulator (HPS), and peer partner. Students and faculty interacted through discussion before, during, and after the simulation about the simulation objectives and student performance. Collaborative learning in the simulation was accomplished through teamwork and collaboration among students. The DNP student held high expectations of the students' performance and knowledge in the simulation and those expectations were clearly communicated to the students prior to the simulation through discussion. Students were expected to perform independently as a nurse without assistance from an instructor. Students were expected to be competent in the care tasks required by the simulation. The simulation fostered learning in all students regardless of their learning style, life experiences, or background. Simulation accommodates student diversity with various learning styles, background, and experiences. Time on task was fostered by focusing the simulation on the key concepts of patient safety while caring for multiple patients.

The five key components of successful simulation design were included in the simulation plan including: the teacher, the student, educational practices, simulation design characteristics, and outcomes (Jeffries & Rogers, 2007). Objectives of the simulation were disseminated to the students prior to the experience during briefing and again prior to each of the simulations in the series. The objectives included the

timeframe of 20 minutes and expected roles including primary nurse and new graduate nurse.

Fidelity in the simulation was maintained with realistic patient scenarios and simulation props. To ensure fidelity was as valid as possible, the DNP student independently practiced the simulation prior to the student sessions to determine the realism of the scenario and the placement and availability of pertinent props. Fidelity was also enhanced by limiting information given to students regarding the details of the simulation.

The multiple patient simulations were complex, similar to multiple patient assignment s. The team of patients included a patient with a postoperative hemorrhage; a patient with a postoperative deep vein thrombosis; a patient with hypoxia and tracheostomy care; and a patient with congestive heart failure exacerbation. The simulation incorporated provider roles including that of the primary nurse and of the new graduate nearing the completion of orientation. Inclusion of a two roles provided the opportunity for teamwork, collaboration, communication, and delegation.

Debriefing was conducted after each simulation session and included only the student who participated in that particular simulation. The debriefing session reinforced the positive experiences of the simulation and encouraged students to learn through reflection. The debriefing sessions were conducted according to the debriefing tool developed by Ironsides, Jeffries, and Martin (2009, Appendix A). The debriefing sessions were lead by the DNP student, but the students were encouraged to freely discuss the simulation according to their needs.

Strengths and limitations of the theoretical framework for EBP project. The NESF was used to plan the simulations for this EBP project. The strengths of the NESF include the key factors to successful simulation outcomes including the teacher, the student, educational practices, simulation design characteristics, and outcomes (Jeffries & Rogers, 2007). The model specifically defines the key factors as they relate to simulation in nursing education. The model is limited by the absence of ongoing research to support the key elements, variables, and relationships defined by the model.

EBP model of implementation

The EBP project was guided by the Promoting Action on Research Implementation in Health Services (PARiHS) framework. Many factors contribute to successful implementation of evidence and change in practice (Rycroft-Malone, 2004). Factors contributing to the implementation of evidence and change in practice include the quality of research, types of evidence, clinical experience, patient experience, local data, culture, leadership, evaluation, task characteristics, skills, and attributes among others (Rycroft-Malone, 2004). The relationships of the factors are used by the PARIHS framework to facilitate implementation of evidence-based practice. The PARIHS framework was the base of this project to assure these factors were addressed and the evidence was appropriately applied.

The PARIHS framework attempts to address the complexities of the changes involved in the implementation of evidence-based practice changes (Rycroft-Malone, 2004). The PARIHS framework was developed in 1998 by a team of experts in research, practice, and quality improvement at the Royal College of Nursing Institute (Rycroft-Malone, 2004). The PARIHS framework continues to be refined and is often

utilized as a diagnostic and evaluative tool for evidence-based practice (Rycroft-Malone, 2004). According to the PARIHS framework successful implementation of evidence depends upon the nature and type of evidence, the qualities of context in which evidence is introduced, and how the process is facilitated (Kitson, Roycroft-Malone, Harvey, McCormack, Seers & Tichen, 2008).

The main features and assumptions of the PARIHS framework address the sources of evidence the implementation of evidence into practice, the context into which the evidence is implemented, and facilitation of the process of implementation. The first assumption is that evidence comes from multiple sources including knowledge; research; clinical experience including personal craft knowledge, patient preferences and experiences; and local information (Kitson, Roycroft-Malone, Harvey, McCormack, Seers & Tichen, 2008). Secondly, implementation of evidence involves negotiation and development of a shared understanding about the benefits, risks, and advantages of the new practices over the old practices. Implementation of evidence-based practice is a team effort (Kitson et al, 2008). Third, some contexts are more appropriate for the implementation of evidence-based change. Contexts conducive to the changes are those with transformational leaders, those that embrace learning, and those with effective monitoring, evaluative, and feedback systems of the change process (Kitson et al, 2008). The fourth assumption is that there is a need for effective facilitation to ensure success in the implementation of evidence-based practice change (Kitson et al, 2008).

The PARIHS frame work defines evidence as a combination of research, clinical expertise, and patient choice (Kitson, Gill, & McCormack, 1998). Evidence may occur within a range of conditions from high evidence to support effectiveness to low evidence

to support effectiveness (Kitson et al, 1998). Successful implementation of evidence-based practice change requires evidence that is toward the high end of the continuum. The location of evidence along the continuum depends on many factors, for example clinical experience that has been verified through reflection, debate, and critique may be higher than one individual research study (Rycroft-Malone, 2004).

Context, or the setting in which the proposed change is to be implemented, has three factors that contribute to successful implementation of evidence. Successful implementation is promoted by the setting's culture, leadership, and evaluation (Rycroft-Malone, 2004). Cultures that are conducive to change are those that value individuals, group processes, and organizational systems. Transformational leaders are more conducive to evidence-based change because they are able to merge the science of healthcare with the art of caring (Rycroft-Malone, 2004).

Facilitation, the final core element of the PARIHS framework, is a practice where one individual makes things easier for others. In the case of evidence-based practice change, facilitation aims to made the process of implementing evidence easier (Rycroft-Malone, 2004). In the PARIHS framework facilitation is on a continuum with the high end being the presence of appropriate facilitation and the low end being the absence of facilitation (Rycroft-Malone, 2004). The facilitator is an individual who helps others make a change in practice by guiding them through the process of change. Facilitators have roles, skills, and knowledge to help others apply evidence. The skills and attributes required by the facilitator are dependent upon the situation and task (Rycroft-Malone, 2004).

Application of PARIHS framework to EBP project. In applying the PARIHS framework to this project; the core elements of evidence, context, and facilitation will be utilized to support successful evidence-based practice change. Various types of evidence were collected and reviewed including a review of the literature, the expertise of the DNP student in the area of simulation, discussion with a simulation expert, and review of current curricular content.

The element of context was significant in this project. Context was considered at several levels. First, at the organizational level, readiness for change must be assessed. The nursing division in the college is incorporating the undergraduate QSEN competencies throughout the curriculum. The curriculum currently incorporates simulation in all medical-surgical, pediatric, and obstetrical courses. Support from the college administration as well as from the division faculty was received.

Context is also a significant factor in simulation. Simulation outcomes are improved with increased fidelity or realism (Jeffries & Rogers, 2007). Fidelity includes realistic patient scenarios, simulation props, and environment. Fidelity is a key element in the NESF, which was used to plan and implement the simulation.

In the PARiHS framework context includes the subelement of evaluation. For this project, evaluation of the project was conducted following implementation. Evaluation measures were formal and informal. Formal evaluation was conducted through analysis of the data gathered during implementation. Information evaluation included information gathered during post-simulation debriefing and dialogue with the nursing director and faculty at the site of the project implementation.

Facilitation is a key element of both the PARIHS Framework and the NESF. Facilitation of this project will be accomplished by the DNP student. The DNP student facilitated the change in practice as well as simulations. The DNP student used skills and attributes obtained through specialized training and extensive experience in high-fidelity simulation and debriefing. The expertise of the DNP student contributed to the successful facilitation of the practice change.

The model includes the factors to be considered when planning simulation and is easily utilized with the PARIHS framework for evidence-based practice changes. Both models include environmental factors, teacher characteristics, educational techniques, and facilitation.

Review of the Literature

The literature was searched for the best available evidence on the use of simulation to teach safety competencies. Four databases were searched including Cumulative Index of Nursing and Allied Health Literature (CINAHL), Educational Resources Information Center (ERIC), Joanna Briggs Institute (JBI), and Medline. These databases were utilized because they contain publications focused on nursing and nursing research including international literature.

A research librarian was consulted to assist with the literature search and a preliminary search of CINAHL and MEDLINE was conducted to identify standard search headings. Selected key words were: nursing education AND QSEN AND patient safety and patient simulation AND safety. Following identification of these subject headings and search terms the databases were searched for each key term in the title, abstract, or list of key words. The search continued until duplication of references was achieved.

Inclusion/exclusion criteria

The publication date range was 2005 through 2012. Other inclusion criteria included English language, prelicensure nursing education, patient simulation, patient safety, and safety management. These criteria were selected to keep the focus of the literature review on the use of simulation to teach safety competency in prelicensure nursing education. Articles pertaining to all types of prelicensure education were retained including: baccalaureate, associate, and diploma nursing programs.

Exclusion criteria included evidence relating to staff development, medical education, and graduate nursing education to maintain the focus of the review on prelicensure education. Additional exclusion criteria were computer simulation, conference proceedings, and editorials.

The search results with the keywords nursing education AND QSEN and patient safety included 25 relevant articles in CINAHL and eight in Medline. The keyword search using patient simulation AND safety yielded 10 relevant articles in CINAHL, 25 in Medline, three in JBI, and three in ERIC. The abstracts were reviewed for the inclusion and exclusion criteria and relevant articles were examined. Additionally, a hand search of references was conducted to identify additional articles not identified in the database searches. Duplicate articles were removed. Ultimately 17 articles were retained for review (see Table 2.1).

Table 2.1

Summary of Search Terms and Databases.

Key Words	*CINAHL*	*MEDLINE Via PubMed*	*JBIconNect+*	*ERIC*	*Hand Search*
Nursing Education QSEN Patient Safety	25	8	0	0	-
Patient Simulation Safety	10	25	3	3	-
Articles meeting inclusion criteria	16	6	2	0	4
Articles with exclusion criteria	19	27	1	3	-
Duplicates removed	8	3	0	0	-
Total Articles	8	3	2	0	4

Levels of Evidence

The Rating System for the Hierarchy of Evidence uses seven levels to rate evidence with Level I being the strongest and Level VII being the weakest (Melnyk and Fineout-Overholt, 2005). Seventeen articles were included in the final review including three at Level I, one at Level II, ten at level IV; one at level V; ten at Level VI, and one at Level VII.

Appraisal of relevant evidence

The focus of the appraisal of the evidence was to examine the effectiveness of simulation as an educational intervention to improve patient safety competencies. The characteristics of each study are detailed in Table 2.3. There were three systematic reviews on simulation (Cant & Cooper, 2009; Lapkin, Fernandez, Levett-Jones, & Bellchambers, 2010; Laschinger, Medves, Pulling, McGraw, Waytuck, Harrison, & Gambeta, 2008). Thirteen studies investigated simulation as an educational intervention (Cant & Cooper, 2009; Decker, 2007; Gantt & Webb-Corbett, 2009; Hinneman, Roche, Fisher, Reilly, Nathanson, & Henneman, 2010; Ironside, Jeffries, & Martin, 2009; Lapkin et al, 2010; Lachinger et al, 2008; Miller & LaFramboise, 2009; Nehring, 2008; Radhakrishnan, Roche, & Cunningham, 2007; Sears, Goldsworthy, & Goodman, 2010; Traynor, Gallagher, Martin, & Smyth, 2010; Walker, 2008). Five studies examined simulation with the outcome of improved patient safety (Gantt & Webb-Corbett, 2009; Hinneman et al, 2010; Ironsides et al, 2009; Miller, & Laframboise, 2009; Sears et al, 2010). Two studies evaluated students' reported self-perception of the impact of simulation on knowledge and skills (Traynor et al, 2010; Walker, 2008). One case-control study compared clinical performance of students who practiced with an HPS with the clinical performance of students who did not practice with an HPS (Radhakrishnan et al., 2007). One study explored the critical and reflective thinking processed used by students during and immediately after simulation. One researcher explored the current regulations regarding use of simulation (Decker, 2007). The evidence reviewed included one integrative review focused on patient safety and nurse education level (Ridley, 2008). One study examined the types of errors that occurred or

recovered by nursing students (Henneman et al., 2010). Eight studies focused on patient safety in nursing (Attree, Cooke, & Wakefield, 2008; Barton, Armstrong, Prehaim, Gelmon, & Andrus, 2009; Chenot & Daniel, 2010; Gantt. & Webb-Corbett, 2009; Henneman et al., 2010; Ironsides et al., 2009; Ridley, 2008; Sears et al., 2010.). Three studies explored patient safety competencies in nursing curricula across the United States (Attree et al., 2008; Barton et al., 2009; Chenot & Daniel, 2010).

Table 2.2

Summary of Literature Critical Appraisal

Authors	Level of Evidence	Study Design	Purpose	Sample	Topic	Implications
Attree, M., Cooke, H. & Wakefield, A. (2008)	Level VI	Case study	To explore patient safety in English pre-registration nursing curricula	An English pre-registration nursing degree curriculum	Patient safety	There is a need to clarify patient safety and to explicitly address patient safety.
Barton, A. J., Armstrong, G., Preheim, G., Gelmon, S. B., Andrus, L. C. (2009)	Level VII	Descriptive DELPHI	To determine whether there was consensus on the developmental progression of knowledge, skill, and attitude elements within QSEN competencies	18 subject matter experts	QSEN	Creation of curricular threads to facilitate student progression was validated. Complex concepts such as teamwork and collaboration, evidence-based practice, quality improvement, and informatics were emphasized in advanced classes.

Authors	Level of Evidence	Study Design	Purpose	Sample	Topic	Implications
Cant, R. P. & Cooper, S. J. (2009)	Level I	Systematic Review	To review quantitative evidence for medium to high fidelity simulation using manikins in nursing education in comparison to other educational strategies	12 studies	Simulation	All studies validated simulation as a valid educational technique. Simulation was superior in its effect on knowledge compared to traditional lecture used alone.
Chenot, T. M. & Daniel, L. G. (2010)	Level VI	Survey	To examine current patient safety education for nursing students and investigate nursing student awareness, skills, and attitudes about patient safety.	Phase I n= 400 members of a scholarly professional nurses' organization Phase II n= 618 associate degree and baccalaureate nursing students	Patient safety	Findings from the current study support the evidence that there are opportunities for improvement for patient safety curriculum in schools of nursing

Authors	Level of Evidence	Study Design	Purpose	Sample	Topic	Implications
Decker, S. (2007)	Level VI	Grounded Theory Qualitative	To explore critical and reflective thinking processes used by senior BSN students during and immediately after simulation	Senior BSN students	Simulation	Learners were at different stages of thinking processes and the stage of thinking was based on the learner's foundation in theoretical knowledge, skills competency, experiential knowledge, and mindset.
Gantt, L. T. & Webb-Corbett, R. (2009)	Level VI	Case study	To describe how one college began to integrate patient safety instruction into simulation for undergraduate nursing education	Students in the senior clinical capstone course (N=194)	Patient safety Simulation	Patient safety behaviors improved over two semesters. Simulation provides an opportunity to teach patient safety with well-defined standards for performance of certain competencies.
Hinneman, E. A., Roche, J. P., Fisher, D. L., Reilly, C. A., Nathanson, B. H., & Henneman, P. L. (2010)	Level VI	Descriptive	To examine types of errors that occurred or that were recovered in a simulated environment by student nurses.	50 senior nursing students	Simulation Patient safety	100% of student subjects committed rule-based errors. Educators must find effective strategies to teach patient safety behaviors.

Authors	Level of Evidence	Study Design	Purpose	Sample	Topic	Implications
Ironside, P. M., Jeffries, P. R., Martin, A. (2009)	Level VI	Descriptive Pretest-posttest	To investigate the extent to which student experiences with multiple-patient simulation improved their patient safety competencies. To investigate the student factors related to that outcome (achievement of patient safety competencies).	Purposive sample baccalaureate degree and associate degree nursing programs, and student class sizes ranging from 14–120 students	QSEN Simulation	Use of simulations as a mechanism to provide opportunities to care for multiple patients and practice patient safety competencies has proved to be effective in this multisite study. No significant correlations were found between tolerance of ambiguity, age, or GPA, respectively, and the achievement of patient safety competencies either in the initial or second simulation experience, contrary to what was predicted in the study hypotheses.
Lapkin, S., Fernandez, R., Levett-Jones, T., & Bellchambers, H. (2010)	Level I	Systematic Review	To identify the best available evidence for the use of HFPS to teach clinical reasoning.	8 studies	Simulation	Evidence suggests that HFPS significantly improves outcomes related to clinical reasoning including critical thinking, clinical skills, and knowledge acquisition.

Authors	Level of Evidence	Study Design	Purpose	Sample	Topic	Implications
Laschinger, S., Medves, J., Pulling, C., McGraw, R., Waytuck, B., Harrison, M. B., & Gambeta, K. (2008)	Level I	Systematic Review	To identify the best available evidence on the effectiveness of using simulation in prelicensure education.	23 studies	Simulation	Simulation can be used as a clinical adjunct rather than a replacement for clinical practice.
Miller, C. L. & LaFramboise, L. (2009)	Level IV	Quasi-experimental	To test the effects of integrated classroom and clinical content related to safety and quality of health care systems versus classroom content alone.	Senior BSN students in an adult medical-surgical course	Simulation Patient Safety	A combined approach of classroom and clinical learning activities have the strongest impact on student KSA related to safety and quality.

Authors	Level of Evidence	Study Design	Purpose	Sample	Topic	Implications
Nehring, W. M. (2008)	Level VI	Descriptive	To ascertain use of HPS for clinical time in current regulations	44 states, the District of Columbia, and Puerto Rico	Simulation	There is a growing attention to HFPS across the states. Many states are reviewing prelicensure nursing education and the use of HFPS. All nursing faculty need to be mindful of nursing education outcomes to prepare graduates who are safe and competent.
Radhakrishnan, K., Roche, J. P., & Cunningham, H. (2007)	Level VI	Study	To identify clinical practice parameters influenced by HPS by evaluating clinical performance	12 senior BSN students	Simulation	Students who practiced with the simulator in addition to clinicals had significantly higher scores than those who did not practice with the simulator.
Ridley, R. T. (2008)	Level V	Integrative Review	To assess the current state of the science of patient safety and nurse education level.	24 studies	Patient Safety	Increasing RN dose (such as number of care hours) and skill mix (versus LPN) are associated with improved patient safety. However, there is no evidence to link RN educational level with patient safety.

Authors	Level of Evidence	Study Design	Purpose	Sample	Topic	Implications
Sears, K., Goldsworthy, S., & Goodman, W. M. (2010)	Level II	Clinical trial	To examine whether the use of clinical simulation can decrease medication errors	54 students; experimental group (n=24) and control group (n=30)	Simulation Patient safety	Students who did not participate in simulation had a larger rate of medication errors (80%) than students who had a prior simulation-based experience (29%).
Traynor, M., Gallagher, A., Martin, L. Smyth, S. (2010)	Level VI	Descriptive	To examine how students perceived the impact of simulation on clinical practice	90 3rd year prelicensure nursing students	Simulation	Students reported that they valued the experience as a means of highlighting gaps in knowledge and that the experience gave them confidence for future practice.
Walker, S. (2008)	Level VI	Descriptive Post-test	To compare perceived self-efficacy and learner satisfaction	91 undergraduate students participating in HPS (n=51) and standardized patient simulation (n=40)	Simulation	HPS students were statistically more self-efficacious. No statistical difference in learner satisfaction was found.

Literature Findings: Patient Safety. The QSEN project was a response to the call from the IOM to establish competencies for all RNs (Ironside et al., 2009). The QSEN initiative established six competencies with associated KSAs essential for inclusion in all prelicensure nursing educational programs. In 2009, Barton and colleagues conducted a Delphi survey to determine consensus regarding QSEN competencies and the developmental progression of the competencies across curricula. The authors concluded that the QSEN competencies are not linear and should be threaded throughout the curriculum and the KSAs are separate and distinct elements to be learned as such. The authors also found that the competencies of teamwork and collaboration and quality improvement occur later in the curricula where teams and systems are naturally included. This study supports the placement of multiple patient simulations near the end of the curriculum.

Chenot and Daniel (2010) examined current patient safety education for nursing students and investigated nursing student awareness, skills, and attitudes about patient safety. The study's overall goal was to develop recommendations for the knowledge base for nursing competency as safe practitioners. The study evaluated students' perceptions about their awareness, skills, and attitudes about patient safety. The results indicated the participants recognized their responsibility for patient safety. However, the results also indicated that younger female participants were not as comfortable with patient safety issues as their male counterparts. The researchers found that there was a statistically significant relationship between the demographic variable of race and ethnicity and the students' perceptions about patient safety awareness, skill, and attitudes. The researchers found that participants in associate degree programs had

higher error reporting and comfort scores than participants in accelerated and traditional baccalaureate nursing degree programs (Chenot & Daniel, 2010).

Ridley (2008) conducted a systematic review and found the evidence did not support a link between educational level and improved safety. In a review of 24 studies to assess the current state of patient safety and nurse education level, Ridley (2008) found that an increased Registered Nurse (RN) dose (e.g., number of RNs per shift versus Licensed Practical Nurses (LPNs) and RN to patient ratios) were associated with increased patient safety. The findings of this review indicate the necessity of including patient safety in an ASN curriculum.

Attree, Cook, & Wakefield (2008) presented a case study of an English pre-registration nursing degree curriculum. The authors found that the curriculum would be improved with clarification of patient safety. The authors also found the need to discuss patient safety explicitly across the curriculum. These findings support the intent of the QSEN initiative to define patient safety and provide a mechanism for explicit inclusion within curricula.

Literature Findings: Simulation in Nursing Education. Cant and Cooper (2009) conducted a systematic review of quantitative evidence related to medium- and high-fidelity simulation as compared with traditional educational methods. The authors found that all 12 studies included in the review validated simulation as an educational technique. Simulation was found to be superior in its effect on knowledge compared to traditional lecture used alone. Best practice guidelines were identified and included physical environment characteristics, curriculum based scenarios, academic support, and repeated exposure to simulation (Cant & Cooper, 2009). Best practices also include

a three-step simulation process that includes briefing, simulation, and debriefing (Cant & Cooper, 2009).

Lapkin, Fernandez, Levett-Jones, and Bellchambers (2010) also conducted a systematic review to identify the best evidence for the use of high fidelity patient simulation (HFPS) to teach clinical reasoning. The authors reviewed eight studies and found that the evidence validated HFPS to improve outcomes related to clinical reasoning, critical thinking, clinical skills, and knowledge acquisition supporting the use of simulation as an educational intervention.

Laschinger, Medves, Pulling, McGraw, Waytuck, Harrison, and Gambeta (2008) conducted a systematic review to identify the best available evidence on the effectiveness of using simulation in prelicensure education. Upon review of 23 studies, the authors found simulation can be used effectively as a clinical adjunct rather than a complete replacement for hospital clinical experiences. These findings support the use of HFPS for concepts when appropriate hospital clinical experiences are not available.

Individual studies support simulation as an educational intervention as well. Radhakrishnan, Roche, and Cunningham (2007) conducted a case-control study with 12 senior bachelor of science in nursing (BSN) students to identify clinical practice parameters influenced by HPS by evaluating clinical performance. The authors found that students who practiced with a HPS in addition to clinicals had significantly higher scores on clinical performance than those who did not practice with an HPS. In a qualitative study, Decker (2007) found that learners were at different stages of thinking processes during simulation and that the stage of thought process was based on the learner's foundation in theoretical knowledge, skills competency, experimental

knowledge, and mindset. These findings support diversity in the approach to learners during simulation.

In a descriptive post-test study, Walker (2008) found that HPS students were statistically more self-efficacious than students who did not participate in HPS. This finding supports the NESF factor of student outcomes. Students who perceive themselves to be self-efficacious are more directed and responsible for their own learning.

Another important student factor is learner satisfaction (Jeffries & Rogers, 2007). Traynor, Gallagher, Martin, and Smyth (2010) examined how students perceive the impact of simulation on clinical practice. The authors studied 90 third-year prelicensure nursing students. The students reported that they valued the experience as a means of highlighting gaps in knowledge and that the experience gave the confidence for future practice. This study supports simulation as an educational intervention that students prefer over other educational interventions.

To ascertain the current regulations regarding the use of HPS for clinical time, Nehring (2008) surveyed 44 states, the District of Columbia, and Puerto Rico. Nehring (2008) found growing attention to HPS across the country. This study concluded that there is a growing use of HPS and many states are reviewing the use of HPS in prelicensure nursing education and considering regulating the use of HPS.

Literature Review: Patient Safety and Simulation. The use of simulation as an educational intervention to improve patient safety is validated in research as well. Miller and LaFramboise (2009) tested the effect of integrated classroom and clinical content related to safety and quality of health care systems versus classroom content alone. In

this quasi-experimental study, the authors found that a combined approach of clinical and classroom educational intervention had the strongest impact on student KSAs related to quality and safety.

Sears, Goldsworthy, and Goodman (2010) also found that simulation improved patient safety competency. In a clinical trial, the authors examined whether the use of clinical simulation can reduce medical errors. Eighty percent of students who did not participate in simulation committed a medication error whereas only twenty-nine percent of students who had a prior simulation experience committed a medication error. These findings support the use of HFPS to improve patient safety competencies.

In a descriptive study of 50 senior nursing students, Hinneman, Roche, Fisher, Reilly, Nathanson, & Henneman (2010) examined the types of errors that occurred or were recognized and corrected in a simulation. The authors found that one hundred percent of students committed a rule-based error and exhibited overall low ability to recover errors. The study included two simulations where error recovery rates ranged from twenty-eight percent to eighty-percent. Thus, the authors conclude educators must find effective educational interventions to teach patient safety. These findings validate simulation as an effective method to evaluate patient safety competencies.

In a case study by Gantt and Webb-Corbett (2009), patient safety behaviors improved with simulation as an educational intervention after two semesters. The authors found that simulation provides an opportunity to teach patient safety with well-defined standards for performance of certain competencies. These findings support the use of simulation to teach patient safety competencies according to the QSEN KSAs.

Ironsides, Jeffries, and Martin (2009) investigated the extent to which student experiences with multiple-patient simulation improved patient safety competencies. The authors found that nursing students must engage in the culture of safety to become competent. The use of simulation as an educational intervention was effective in this multisite study. The results of this study validate the use of multiple patient simulations as an educational intervention to address patient safety.

Best Practice Recommendations

The best practice recommendation for this project is the use of a series of multiple patient simulations to allow repeated exposure to patient safety concerns. The evidence obtained from this literature review validated simulation as an effective educational intervention to teach patients safety competencies. The studies reviewed focused on simulation, patient safety, and simulation and patient safety. The studies focused on prelicensure nursing education and educational level. Simulation was reported to be as effective as other interactive educational interventions and more effective than traditional lecture used alone. The evidence also supports the use of simulation as an adjunct to hospital clinical experiences when appropriate hospital experiences are not available.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

In an effort to determine the effect of simulation as an educational intervention on patient safety competency in prelicensure nursing students, an evidence-based practice project was planned according to the PARiHS. The project included multiple patient simulations developed according to the NESF. The project included students from the nursing program at the site of implementation in an effort to improve patient safety competencies within this rural nursing program.

Sample and setting

The population of interest in this project was prelicensure nursing students enrolled in an Associate of Science in Nursing (ASN) degree program. The sample was a convenience sample recruited from a rural private two-year college in the Midwest. The students were in the third semester of the ASN curriculum. Students were recruited to participate in a series of four multiple patient simulations.

Each student participated in a series of four multiple patient simulations. The simulations closely mimicked typical experiences of a new nurse assigned to care for four patients in a medical-surgical unit in a rural facility. The simulations included common safety risks that occur in the complex care delivery situations in which nurses practice including distractions, interruptions, handoffs, and conflicting information about patients' conditions. The simulations used were purchased by the college for use as a package from Medical Education Technologies, Inc. (METI). The simulations were modified to meet the needs of this evidence-based project and in accordance with the NESF.

Each simulation involved two nursing students caring for four different patients. Students were randomly assigned to either the role of primary RN or the role of a newly licensed RN nearing the completion of orientation. The role for each student changed for each simulation such that each student participated in the role of the primary RN twice and the new RN twice. Each simulation ran for 20 minutes with a distraction or interruption occurring at the seven and ten minute marks and a patient care handoff occurring at the 15 minute mark. The each pair of students experienced a different event in a different patient during each of the simulations. Subsequent simulations were adjusted such that each student pair experienced complications in each of the four simulated patients. Each student pair participated in four multiple patient simulations.

Recruiting sample

A convenience sample was recruited from the college's prelicensure nursing program. The sample recruiting techniques ensured adequate representation of the current nursing cohort by inviting all students within the nursing cohort currently enrolled in the second medical-surgical course. Sampling was by invitation and was anonymous.

The sample was recruited from the second medical-surgical nursing course at the college. This medical-surgical nursing course is taken in the third semester of the two year program. Students from all clinical sections were invited to participate on a voluntary basis, no restrictions were imposed on project participation, and no compensation or extra credit was rewarded for participation in the project.

Outcomes

The aim of this project was to evaluate the effects of a series of multiple patient simulations on patient safety competence in rural prelicensure ASN students.

Expectations were that student safety competency would be demonstrated in each of 16 areas as listed in table 3.1 after participation in the series of multiple patient simulations.

Table 3.1

Student Safety Competencies

1. Communicates patient values, preferences and expressed needs to other members of the health care team
2. Assess presence of extent of pain and suffering
3. Assesses levels of physical and emotional comfort
4. Initiates effective treatments to relieve pain and suffering in light of patient values, preferences and expressed needs
5. Engages patients or designated surrogates in active partnerships that promote health, safety and well-being, and self-care management
6. Communicates care provided and needed at each transition in care
7. Demonstrates awareness of own strengths and limitations as a team member
8. Functions competently within own scope of practice as a member of the health care team
9. Assumes role of team member or team leader based on the situation
10. Initiates requests for help when appropriate to the situation
11. Clarifies roles and accountabilities under conditions of potential overlap in team member functioning
12. Solicits input from other team members to improve individual, as well as team, performance
13. Follows communication practices that minimize risks associated with handoffs among providers and across transitions in care
14. Asserts own position/perspective in discussions about patient care
15. Chooses communication styles that diminish the risks associated with authority gradients among team members
16. Uses appropriate strategies to reduce reliance on memory

Note. Adapted and used with permission from Quality and Safety Education for Nurses. (2011). *Instrument to measure safety competencies.* Retrieved from www.qsen.org.

Intervention

The PARiHS framework was utilized to guide the implementation of this evidence-based project. In accordance with the PARiHS framework, the three key components of evidence, context, and facilitation were considered during the planning phase. Integral to the PARIHS framework is the existing evidence (Kitson, Harvey & McCormack, 1998). A review of the literature was conducted and the decision was

made to utilize simulation scenarios purchased and programmed into the college's HPS. The simulations focused on patient safety competency during a series of four multiple patient care scenarios.

The PARiHS framework emphasizes the context in which the project will take place. Accordingly, the scenarios selected for the project closely mimicked a team of patients an RN in a local hospital may encounter. The patient scenarios included a client with post-operative complication of deep vein thrombosis, postoperative hemorrhage, acute exacerbation of congestive heart failure, and suctioning and tracheostomy care with hypoxia.

The PARiHS framework also emphasizes the importance of facilitation. The Nursing Education Simulation Framework also emphasizes that the facilitator should be comfortable with the simulation to improve outcomes (Jeffries & Rogers, 2007). The facilitator for this project was a DNP student who has experience in high-fidelity simulation and debriefing.

Planning

The NESF provided the structure for the simulation and debriefing. The NESF identifies essential aspects of simulation design to support desired outcomes (Ironside, Jeffries, & Martin, 2009). The framework considers teacher factors, student factors, educational practices, the design of specific simulations, and student outcomes (Jeffries & Rogers, 2007). For this project, a DNP student was the teacher. The DNP student is comfortable with high-fidelity simulation. The DNP student ensured the simulation is student-focused and that learning was facilitated by supporting the students as necessary.

Simulation design and educational practices are identified by Jeffries & Rogers (2007) as essential aspects for positive student outcomes. In this project, ambiguous educational practices or variation in simulation design was controlled by using simulations designed and programmed by the manufacturer of the HFPS. Additionally, Chickering & Gamson's seven principles will be followed as indicated by the NESF (Jeffries & Rogers, 2007).

Student factors identified by the NESF include program, level, age, and grade point average (Jeffries & Rogers, 2007). This project involved students enrolled in an ASN program who were in the third semester. The average age of students enrolled in the program is 28 years and the average grade point average is 3.0 on a scale of 4.0.

Knowledge, skill performance, learner satisfaction, critical thinking, and self-confidence are all factors that contribute to the outcome of simulations according to the NESF (Jeffries & Rogers, 2007). This project assessed student's safety competency during a series of multiple patient simulations. The outcome of the simulation was affected by active learning, feedback, student- faculty interaction, collaborative learning, high expectations, student diversity, and time on task as previously discussed.

Jeffries and Rogers (2007) also identified debriefing as a critical component of simulation. Debriefing following each of the simulation sessions was conducted according to a standardized format (Appendix A). Debriefing was facilitated by the DNP student and included both student participants after each simulation experience. The debriefing reinforced patient safety competency concepts through open discussion of the student's interpretation of the simulation using questions to guide the discussion and focus the reflection upon safety competencies.

Data

Data collection was conducted by the DNP student through observation of the students during the simulations. Each student was observed individually during the simulation. Throughout the project data was protected to maintain confidentiality and integrity. The data was secured until analysis and then destroyed.

Measures and their reliability and validity. During the simulations, students were observed and assessed according to an instrument developed by Ironside, Jeffries, and Martin (2009). The instrument was used with permission from the developers (Pam Jeffries, personal communication, 2011; Appendix B). The instrument evaluates the patient safety competencies of students and is comprised of 16 knowledge, skills, and attitudes criteria from the QSEN competencies. In a previous study, the instrument demonstrated acceptable internal consistency reliability for patient safety competencies (Chronbach's alpha = 0.89; Ironside, Jeffries, & Martin, 2009).

Collection. Students were observed and the instrument was scored by the DNP student during the simulation. The DNP student indicated whether each criterion was demonstrated by each student observed. During the simulations the students participated as either a primary nurse or a nurse in orientation. The interaction of students in these roles allowed individual observation and scoring of the instrument. The DNP student also was the instructor of the participants within the college and had personal prior knowledge of the students. This prior knowledge was a bias and a potential limitation of the project. Students completed a brief demographic form for the purposes of measuring student factors.

Management and analysis. In this case-control study, the data gathered from the subjects was analyzed with SPSS 18 utilizing epidemiological statistical methods. Initially, the instrument was utilized to gather baseline safety competency data on the subjects to serve as the control data. The prevalence rate of patient safety errors was calculated from the first simulation data for each individual participant. The prevalence rate was calculated following each simulation experience. At the end of the fourth simulation experience, a prevalence rate of patient safety competencies was calculated. The odds ratio of poor safety competencies was calculated and the relationship between participation in a series of multiple patient simulations and patient safety competencies was calculated.

Protection of human subjects

Approval from the Valparaiso University Internal Review Board (IRB) and the IRB at the college were obtained. All participants were over the age of 18 years. Each participant received an informed consent that included the name and contact information of the DNP student, the purpose of the project, what the project involved, risks and benefits, and how the data was handled (Appendix C). The informed consent also indicated that participation was voluntary and that withdrawal possible at anytime without consequences. The informed consent included contact information for the Nursing Director at the site of implementation to serve as a contact person other than the DNP student.

Each student was assigned a code number. Student names, code numbers, and personal data were kept separately from the study data in a locked drawer in the simulation lab, which was also locked when not in use. Student anonymity and

confidentiality was maintained at all times. Upon completion of the study, all data was destroyed by shredding of documents and permanent deletion of electronic files.

CHAPTER 4

FINDINGS

In an effort to determine the effect of a series of simulations on patient safety competency in prelicensure nursing students, an evidence-based practice project was implemented utilizing the PARiHS Framework. The project included multiple patient simulations developed according to the NESF. The aim of this project was to evaluate the effects of a series of multiple patient simulations on patient safety competence in rural prelicensure ASN students. Expectations were that student safety competency will be demonstrated in each of 16 areas after participation in the simulations.

Sample Characteristics

The sample consisted of 12 ASN students from a rural college in the Midwest (Table 4.1). The ages ranged between 26 and 50 years with a mean age of 34.27 years (*SD* = 10.14). The sample included ten female (83.3%) and two male participants (16.7%). Three (25%) participants were African American and nine (75%) were Caucasian. The sample included four (33.3%) traditional ASN students and eight (66.7%) LPN – ASN students.

Attrition. Four students withdrew from project. One student withdrew after completion of two simulations and three students withdrew after completion of the baseline simulation. The data from these students were not included in the final data analysis.

Table 4.1

Sample Demographic Data

N = 12		
Age	Range 26 – 50 years	*M* = 34.37 (SD = 10.14)
Gender	83% female	17% Male
Ethnicity	75% Caucasian	25% African-American
Program	67% LPN-ASN	33% ASN
Attrition	*n=8*	

Instrumentation

The safety competencies of the participants were observed by the DNP student. Safety competencies were scored as either demonstrated or not demonstrated by individual participants during each simulation. The instrument used to score record demonstration of competencies was developed by Ironside, Jeffries, and Martin (2009). The instrument was used with permission from the developers (Pam Jeffries, personal communication, 2011; Appendix B). The instrument evaluates the patient safety competencies of students and is comprised of 16 knowledge, skills, and attitudes criteria from the QSEN competencies. In the original study, the instrument demonstrated acceptable internal consistency reliability for patient safety competencies (Chronbach's alpha = 0.89; Ironside, Jeffries, & Martin, 2009). The instrument also demonstrated acceptable internal consistency reliability for patient safety competencies in this project (Chronbach's alpha = 0.81).

Statistical testing. A case-control design was used to answer the PICOT question. This method was used to determine the effect of a series of multiple patient simulations as an educational intervention on patient safety competency. Data were analyzed using

SPSS version 18. The first data from the first simulation were used as control data and data from subsequent simulations were used as case data.

Significance. The aim of this project was to evaluate the effects of a series of multiple patient simulations on patient safety competence in rural prelicensure ASN students. Safety competency before and after participation in a series of multiple patient simulations was compared to answer the PICOT question: In rural ASN prelicensure students, what is the effect of a series of multiple patient simulations as compared to baseline competency on patient safety competencies over four weeks?

The safety competency data were analyzed and the prevalence of safety errors was calculated. In the first simulation the prevalence of safety errors was 25 errors in 100 behaviors. The prevalence of safety errors in the fourth simulation was 12 errors in 100 behaviors. There was a significant increase in safety competency from the first simulation to the fourth simulation ($p < 0.05$).

An odds ratio was calculated to determine if an association between participation in the simulation and improved safety competency. The odds ratio of patient safety errors was 2.6 indicating the risk of patient safety errors was greater before simulation than the risk of patient safety errors after simulation. The attributable risk for the first simulation was calculated and 55% of the safety errors may be attributed to nonparticipation in the simulation and could presumably be prevented through participation in the series of multiple patient simulations.

McNemar's Test was calculated to test the null hypothesis. There was a statistically significant change in patient safety errors from the first simulation to the fourth

simulation [χ^2 (1, n=120) = 13.36, p<0.05). Therefore, strong evidence exists to reject the null hypothesis of no effect.

The prevalence of safety errors was calculated for each of the four simulations as listed in Table 4.2. The safety errors decreased across the series with the first simulation demonstrating 25 errors in 100 behaviors; the second 34 errors in 100 behaviors; the third simulation demonstrating 10 errors in 100 behaviors and the fourth demonstrating 12 errors in 100 behaviors. Safety errors were recorded for each observed behavior across the series of simulations (Table 4.3).

Table 4.2

Prevalence of Safety Errors by Simulation Session

Simulation	Prevalence (per 100 behaviors)
1	25
2	27
3	10
4	12

Table 4.3

Safety Errors by Observed Behavior

Observed Behavior	Number of Errors				
	Simulation 1	Simulation 2	Simulation 3	Simulation 4	Total
1. Communicates patient values, preferences and expressed needs to other members of the health care team	2	4	1	1	8
2. Assess presence of extent of pain and suffering	1	0	0	0	1
3. Assesses levels of physical and emotional comfort	2	0	1	0	3
4. Initiates effective treatments to relieve pain and suffering in light of patient values, preferences and expressed needs	2	2	2	0	6
5. Engages patients or designated surrogates in active partnerships that promote health, safety and well-being, and self-care management	5	5	1	2	11
6. Communicates care provided and needed at each transition in care	5	5	1	0	11
7. Demonstrates awareness of own strengths and limitations as a team member	2	3	0	2	7
8. Functions competently within own scope of practice as a member of the health care team	2	2	2	3	9
9. Assumes role of team member or team leader based on the situation	1	1	1	3	6

Observed Behavior	Number of Errors				
	Simulation 1	Simulation 2	Simulation 3	Simulation 4	Total
10. Initiates requests for help when appropriate to the situation	3	2	0	0	5
11. Clarifies roles and accountabilities under conditions of potential overlap in team member functioning	0	2	0	0	2
12. Solicits input from other team members to improve individual, as well as team, performance	0	2	1	0	3
13. Follows communication practices that minimize risks associated with handoffs among providers and across transitions in care	5	3	0	1	9
14. Asserts own position/perspective in discussions about patient care	0	1	1	0	2
15. Chooses communication styles that diminish the risks associated with authority gradients among team members	3	2	1	0	6
16. Uses appropriate strategies to reduce reliance on memory	0	0	1	0	1

CHAPTER 5

DISCUSSION

The purpose of this project was to determine the effect of a series of simulations on patient safety competency in prelicensure nursing students. An evidence-based practice project was implemented utilizing the PARiHS Framework in an effort to answer this PICOT question. The project included multiple patient simulations developed according to the NESF. The results of data analysis were evaluated according the PARiHS Framework. The success of the PARiHS framework in the implementation of the project and the success of the NESF in planning the simulations were considered. Finally, the implications of the results of this project were explored.

Evaluation of the applicability of the PARiHS Framework

The PARiHS framework guided the implementation of this evidence-based practice project. The framework describes the relationships of contributing factors in the application of evidence to change practice including quality of research, types of evidence, clinical expertise, patient experience, local data, culture, leadership, evaluation, task characteristics, skills, and attributes The assumptions of the PARiHS framework are: (a) that evidence comes from multiple sources; (b) that implementation of evidence involves negotiation and a shared understanding of the benefits, risks, and advantages of the new practice over the old; (c) that some contexts are more conducive to the changes; (d) that there is a need for effective facilitation to ensure successful implementation (Rycroft-Malone, 2004). In this EBP project, the core elements of evidence, context, and facilitation were explored during project planning. Various types

of evidence were collected and reviewed, including evidence from research, clinical experts, and local data and culture.

The core element of context within the PARiHS framework includes evaluation which is characterized by the use of multiple feedback mechanisms at the organizational and individual level. For this project, evaluation examined the project outcomes, organizational feedback, and individual feedback.

Evaluation of the effect on safety competency. The major aim of the project was to evaluate the effect of a series of multiple patient simulations on safety competency in prelicensure nursing students. The results of this project support the use of a series of multiple patient simulations to improve patient safety competency in prelicensure nursing students in rural schools of nursing. This outcome is supported by the statistically significant odds ratio (*OR* = 2.6) and McNemar's test [χ^2 (1, n=120) = 13.36, $p<0.05$]. Improvement in safety competency was demonstrated from the first simulation to the fourth simulation. This finding is consistent with the findings by Ironside, Jeffries, and Martin (2009) who conducted a similar project and reported increased safety competencies.

Competency improvement was demonstrated in 94% of the observed competencies from the first simulation to the last simulation. There was decreased error in patient safety competencies from the first to the fourth simulation in all 16 observed behaviors except one: *Assumes role of team member or team leader based on the situation*. In the first three simulations, one safety error was observed in this behavior; however, in the fourth simulation three errors were observed. One possible reason is that the fourth

simulation occurred after the semester break though the remaining 15 competencies continued to improve.

Evaluation of organizational and individual feedback. Feedback from the organization was obtained from the students who participated in the project, faculty who currently teach the course, and the program director. The feedback from students was gathered during debriefing which occurred after each simulation and involved the pair of student participating in that particular simulation. The debriefing session was guided by the questions developed by Ironsides, Jeffries, and Martin (2007, Appendix A). The debriefing sessions were led by the DNP student, but students were encouraged to discuss the simulation openly according to their topic of choice. Data from the feedback sessions were not recorded or statistically analyzed. However, key phrases and comments made by the students were noted by the DNP student as informal participant feedback. Overall, students felt that the simulations were helpful in allowing the experience to care for multiple patients. Comments also indicated that students felt that the series of multiple patient simulations should be included in the curriculum.

Feedback from the course faculty and program director was obtained following a presentation of the outcome data through an information discussion. The responses were not recorded or statistically analyzed. The faculty member currently teaching the second medical-surgical course was eager to include a series of multiple patient simulations in the course; however, the college does not currently have faculty members who are trained in simulation. The program director recognized the significant increase in patient safety competency in the students and plans to incorporate multiple patient simulations in the curriculum in the future.

Based on the outcome data and feedback from participants and organizational members, the project was successful in that it prompted a change in practice. Both participants and organizational members recognize the need to include this evidence-based educational intervention in the curriculum at this facility.

In evaluating this project, the project supports the evidence that multiple patient simulations should be placed near the end of the curriculum (Ironside, Jeffries, and Martin, 2009). The successful implementation of the project agreed with the evidence that patient safety should be included in an ASN curriculum (Chenot & Daniel, 2010; Ridley, 2008). This project improved patient safety competencies through explicit teaching as supported by Attree, Cook & Wakefield (2008). The successful use of simulation as an educational intervention in this project supports existing evidence as well (Cant & Cooper, 2009; Lapkin, Fernandez, Levett-Jones, and Bellchambers, 2010; Laschinger, Medves, Pulling, McGraw, Waytuck, Harrison, and Gambeta, 2008; Radhakrishnan, Roche, and Cunningham, 2007; Decker, 2007; Walker, 2008; Traynor, Gallagher, Martin, and Smyth, 2010; Nehring, 2008). The use of simulation to improve patient safety competencies also validates existing evidence (Miller and LaFramboise, 2009; Sears, Goldsworthy, and Goodman, 2010; Hinneman, Roche, Fisher, Reilly, Nathanson, & Henneman, 2010; Gantt and Webb-Corbett, 2009; Ironsides, Jeffries, and Martin, 2009). Thus, this project contributes to the evidence of the appropriateness of the use of multiple patient simulations in prelicensure nursing education to improve patient safety competencies.

Evaluation of the applicability of the NESF

The implementation of this project was guided by the PARiHS framework and the planning of the simulations was guided by the NESF. The five major components of the NESF were included in planning the simulations including teacher factors, student factors, educational practices, simulation design characteristics, and outcomes.

In this project the teacher was the DNP student who had received specialized training in all forms of simulation, including high-fidelity simulation as in this project. The skills and expertise of the DNP student ensured that the teacher effectively facilitated student learning (Jeffries & Rogers, 2007). Also important to successful simulation is the comfort of the teacher with simulation and the technology which also occurred in this simulation. However evidence regarding specific teacher factors such as educational preparation, years of experience, and clinical expertise is not available.

The students in this project were diverse in age, academic program, race, and experience. Student factors such as competition and performance expectations were controlled by explicit explanation of the roles the students would engage in and the expected outcomes of the simulation and project. Confidentiality of participation was reinforced prior to each simulation to encourage students to suspend disbelief and fully participate in the simulation. Evidence regarding the impact of student factors is limited; therefore, the impact of this component is not clear.

Educational practices such as active learning, diverse learning styles, collaboration, and high expectations are inherent in simulation (Jeffries & Rogers, 2007). In this project these educational practices were addressed through the mere implementation of the simulations as described. The Seven Principles for Good Practice in Undergraduate Education (Chickering and Gamson, 1987) were easily addressed in the simulation

design and implementation. These principles contributed to simulation as an effective teaching intervention by applying effective teaching practice to simulation implementation.

The five features of simulation design (objectives, fidelity, problem solving, student support, and debriefing) were used to design the simulations used in this project. The five features contributed to successful simulation experiences and supported the outcomes of the project by reinforcing the use of simulation as an educational technique. The five features organized the planning of the simulations ensuring that the simulations were reliable and purposeful in teaching patient safety competencies.

The NESF was a critical component of the project. The NESF ensured that the planning and implementation of the simulations was purposeful and intent on meeting the objectives of the project. The NESF complemented the PARiHS framework in that both emphasize context, facilitation, and evaluation.

Strengths and weaknesses of the EBP project

The project strengths include the complementary frameworks used in planning and implementing the project and simulations. The two models worked very well together and shared many of the same attributes focused on different areas of the project. However, the NESF is weak in evidence supporting its concepts and relationships. The model worked well in this EBP project, but future quantitative research will enhance its reliability.

A strength of the project was the use of purchased simulations. The simulations were purchased from the manufacturer of the HFPS and have been reported as valid by the manufacturer. Using these scenarios allowed the focus of the project to be on

changing practice rather than writing scenarios from scratch. This allowed the DNP student to serve as both the facilitator of the practice change as well as the simulation.

A weakness of the project was the timeframe for the completion of the series of simulations. The project took place across a semester break which contributed to attrition. The safety competency improvement may have been stronger if there had not been a semester break during the implementation of the scenarios.

Another weakness of the project was the high percentage of LPN-ASN students as compared with the target population. This was due to the mix of students within the clinical group that was recruited. Many variables contributed to this percentage, but the variables were not controlled and the result was the higher-than-expected LPN-ASN participation. This may have contributed to the increase in patient safety competency as all of the LPN-ASN if the participants were currently practicing or had been practicing as LPNs for an extended time. Future projects should collect data regarding length and type of experience as well as separate data between traditional ASN students and LPN-RN students.

The bias of the DNP student was also a weakness in the project. The project was planned, implemented, and evaluated by the DNP student who was a faculty member at the site of implementation. The DNP student was familiar with the participants and their skill level and nursing experience. This created interviewer bias in the scoring of the instrument.

Implications for the future

An important reason for EBP is to improve practice and outcomes. The gap between evidence and practice change is too long. This project reinforces the ability to

implement evidence in an effort to improve academic practice in nursing education. This project has implications that apply to practice, theory, research, and education.

Practice implications. The outcomes of this project support the use of multiple patient simulations as an educational intervention to teach patient safety competency in prelicensure nursing students. The multiple patient simulations resulted in a statistically significant increase in patient safety competencies. This evidence-based educational intervention is appropriate to the nurse educator competencies defined by the NLN. The intervention is evidence-based and evaluation of the project is supported by the statistically significant increase in safety competency. Future EBP projects should aim to replicate the project to reinforce existing evidence.

Theory implications. The results of this EBP project support the use of the PARiHS framework in the implementation of evidence in educational contexts. The NESF successfully guided the simulation planning and implementation; however, more research is needed to strengthen the theory. Research should strengthen the role of the components in successful simulation outcomes. Particularly, further research is needed on the impact of teacher factors in successful simulation planning and implementation.

Research implications. As discussed, the components of the NESF should be researched to support the concepts and the relationships among those concepts. The framework served the purposes of this project very well; future evidence should be generated to reinforced and define the concepts of the framework. Concepts that should be studied include teacher factors, student factors, facilitation, debriefing, and outcomes. Reinforcing these concepts and their relationships to each other and to

simulation implementation will provide an evidence-based framework upon which HFS can be built.

Educational implications. This project focused on the implementation of simulation as an educational intervention to improve patient safety competencies in prelicensure nursing education. However, the findings can be applied to the use of simulation to teach many concepts and topics. Nurse educators must receive education on the use of simulation as an educational tool inherent in today's nursing education through continued training and professional education. Simulation should be included in nursing curricula to reinforce concepts and complement hospital clinical experiences.

Conclusion

In conclusion, the project demonstrated that a series of multiple patient simulations is an effective intervention to improve patient safety competency in prelicensure nursing students. With the increased focus on patient safety, nursing graduates must have explicit training in safety competencies (Chenot & Daniel, 2010). This EBP project expands the current evidence base supporting simulation to teach patient safety competencies. The project also provides a means for nurse educators to apply best-practice teaching strategies. Simulations, as implemented in this project, provide nurse educators with an evidence-based educational intervention to accomplish increased safety competencies.

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BIOGRAPHICAL MATERIAL

Janeen Berndt

Ms. Berndt graduated from Bethel College with an Associate Degree in nursing in 1997. She began working in the operating room prior to returning to Bethel College for her Bachelor of Science in nursing in 1999. She practiced in the operating room, various intensive care units, and in informatics prior to returning to Valparaiso University for her Master of Science in nursing as an adult health clinical nurse specialist. Following graduation, Janeen obtained certification as a Medical-Surgical Clinical Nurse Specialist through the American Nurses Credentialing Center and as a Certified Nurse Education through the National League for Nursing. Janeen has volunteered as a clinical nurse specialist and parish nurse in her church since 2004. Also in 2004, Janeen began her career in academia in Ancilla College's Associate of Science in nursing program and currently is a faculty member at Western Governor's University where she mentors BSN and MSN students. Janeen is a member of the National League for Nursing and the Midwest Nursing Research Society. As a 2011 NLN Health Information Technology Scholar, she implemented an evidence-based simulation program. Currently, pursing a Doctorate in Nursing Practice from Valparaiso University, which she will complete in May 2012; her doctoral work has focused on educational technologies and simulation, and included publishing a paper on the ethics of simulated clinical experiences in prelicensure nursing education. As a lifelong resident of rural America, Janeen is passionate about innovative clinical experiences for students in rural schools of nursing.

ACRONYM LIST

AHRQ: Agency for Healthcare Research and Quality

ASN: Associate of Science in Nursing

BSN: Bachelor of Science in Nursing

CINAHL: Cumulative Index of Nursing and Allied Health Literature

DNP: Doctor of Nursing Practice

EBP: Evidence-based Practice

ERIC: Educational Resources Information Center

HFPS: High Fidelity Patient Simulation

HPS: Human Patient Simulator

IHI: Institute of Healthcare Improvement

IRB: Institutional Review Board

JBI: Joanna Briggs Institute

KSAs: Knowledge, Skills, and Attitudes

LPN: Licensed Practical Nurse

NESF: Nursing Education Simulation Framework

NLN: National League for Nursing

PARiHS: Promoting Action on Research Implementation in Health Sciences

PICOT: Population, Intervention of Interest, Comparison Intervention, Outcome, Timeframe

RN: Registered Nurse

QSEN: Quality and Safety Education in Nursing

Appendix A

Multiple-Patient Simulation Experiences
DEBRIEFING AND GUIDED REFLECTION QUESTIONS

1. How was this simulation experience?
2. What did you learn?
3. Were you satisfied with your ability to care for these four patients?
4. To New Graduate Nurse:
    a. What did you notice as you watched the nurses provide care?
    b. What did they do well?
    c. Are there things the nurses could have handled differently?
5. To the Primary Nurse:
    a. What did you do well?
    b. If you were able to do this again, how could you have handled the situation differently?
6. What were the most important aspects of this simulation experience?
7. How could this simulation experience be improved?
8. Is there anything else you would like to discuss during this session?

GUIDELINES

- The DNP student will conduct the debriefing/reflecting and will observe the simulation.
- Immediately after the simulation, take students away from the bedside to a separate room for debriefing/guided reflection.
- The debriefing/guided reflection session should last 20 minutes (10 minutes for discussing content and 10 for reflecting on what was learned)
- Be sure to correct and discuss any mistakes or inappropriate actions that occurred, missed assessments, or interventions
- Give a 5 minute warning before the end of the simulation itself and before the end of the debriefing/reflecting session (But don't leave before any mistakes that occurred are corrected.)

Note. Used and *a*dapted with permission from; Jeffries, Pamela R. (2007). *Simulation in Nursing Education from Conceptualization to Evaluation.* New York: National League for Nursing

Appendix B

Patient Safety Competencies	Not demonstrated	Demonstrated Independently
1. Communicates patient values, preferences and expressed needs to other members of the health care team	O	O
2. Assess presence of extent of pain and suffering	O	O
3. Assesses levels of physical and emotional comfort	O	O
4. Initiates effective treatments to relieve pain and suffering in light of patient values, preferences and expressed needs	O	O
5. Engages patients or designated surrogates in active partnerships that promote health, safety and well-being, and self-care management	O	O
6. Communicates care provided and needed at each transition in care	O	O
7. Demonstrates awareness of own strengths and limitations as a team member	O	O
8. Functions competently within own scope of practice as a member of the health care team	O	O
9. Assumes role of team member or team leader based on the situation	O	O
10. Initiates requests for help when appropriate to the situation	O	O
11. Clarifies roles and accountabilities under conditions of potential overlap in team member functioning	O	O
12. Solicits input from other team members to improve individual, as well as team, performance	O	O
13. Follows communication practices that minimize risks associated with handoffs among providers and across transitions in care	O	O
14. Asserts own position/perspective in discussions about patient care	O	O
15. Chooses communication styles that diminish the risks associated with authority gradients among team members	O	O
16. Uses appropriate strategies to reduce reliance on memory	O	O

Note. Adapted and used with permission from Quality and Safety Education for Nurses. (2011). *Instrument to measure safety competencies.* Retrieved from www.qsen.org.

Appendix C

Dear Lifespan II Student,

I am a doctoral student and Nursing faculty at your college. I need your help. I am interested in your safety competencies and how they are affected by simulation. You are being asked to participate in a series of multiple patient simulations over a period of eight weeks. Participation is completely voluntary. Each simulation session will take approximately 1 hour.

If you are interested in participating, please read this consent form and return it to me. There will be no direct benefit to you for participation in this project. If you choose not to participate, your grade will not be affected. Your grade in the course will not be affected whether you participate or not.

Consent Statement:

I am being asked to participate in an Evidenced Base Practice (EBP) project conducted by a doctoral student from the College of Nursing at Valparaiso University. Part of this project will include the assessment of nursing student's performance of patient safety competencies. If I agree to take part in this project, I will participate in a series of multiple patient simulations. There will be a total of four simulation sessions over a period of 8 weeks. Each simulation session will last about 1 hour.

I must be 18 years of age and older to participate. I know that participating in this project is up to me, and I am free to stop at any time. I know that all information about me will stay confidential. I know that only a code number will identify me as a participant and no personal information will be used in the reporting or publishing of the results of this questionnaire.

There is no anticipated risk for injury or harm to me by participating in this project. By sharing my insights, others will better understand the effect of simulation on safety competencies in nursing students. I understand that information obtained from this project may be used in professional publications and/or presentations.

I have read and understand this consent form and I agree to participate in this project by answering the questionnaire. Completion of the questionnaires indicates my consent to participate. I understand that I can withdraw from the project at any time.

If I have any questions about this project, I can contact Janeen Berndt, Assistant Professor of Nursing 574-935-8898 or by email at janeen.berndt@ancilla.edu. Additionally, if you experience any problems as a participant in this project you may contact the Nursing Division Director, Ann Fitzgerald at 574-935-8898 or by email.

Thank you for your help,

Janeen Berndt, MSN, RN
Assistant Professor Nursing

Appendix D

National League for Nursing

August 10, 2011

Janeen Berndt, MSN, RN, CNS-BC, CNE
Valparaiso University
1700 Chapel Drive
Valparaiso, IN 46383
janeen.berndt@gmail.com

Dear Ms. Berndt:

I am writing in response to your e-mail of July 13, 2011, in which you request permission to use material from an NLN publication within your DNP studies at Valparaiso University. I am pleased to grant you the following permission:

> The Simulation Model contained within the book noted below may be used within your DNP studies at Valparaiso University.
>
> > Jeffries, P. R. (2005, March). A Framework for Designing, Implementing, and Evaluating Simulations Used as Teaching Strategies in Nursing. Nursing Education Perspectives , Vol. 26 (No. 2), pp. 96-103.

In granting permission to include the material noted above, it is understood that the following assumptions operate and "caveats" will be respected:

- The material will be included only in the above noted study.
- The material will not be modified in any way.
- The material will be cited as noted above.
- The publication in which this material appears will acknowledge that it has been included with the permission of the National League for Nursing, New York, NY.
- No fees are being charged for this copyright permission.
- The National League for Nursing owns these rights being granted.

I am pleased that material published by the NLN is seen as valuable, and I'm pleased that we are able to grant permission for its use. Please call me ***(212-812-0329)*** with any questions about items noted in this letter. Thank you.

Most sincerely,

Linda S. Christensen, JD, MSN, RN
Chief Administration Officer
National League for Nursing
lchristensen@nln.org